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Music, Video and Perception: An investigation into shaping attitudes toward fish and their natural habitat

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MUSIC, VIDEO AND PERCEPTION: AN INVESTIGATION INTO SHAPING ATTITUDES TOWARD FISH AND THEIR NATURAL HABITAT

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by

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ABSTRACT

MUSIC, VIDEO AND PERCEPTION: AN INVESTIGATION INTO SHAPING ATTITUDES TOWARD FISH AND THEIR NATURAL HABITAT

by

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The current study investigated the influence of music and video on perceptions of fish, willingness to help aquatic conservation efforts, and attitudes about the marine environment. Participants were randomly distributed to one of six groups which varied by presenting information about marine life in a video format or through printed text (i.e., video or pamphlet) and on the background music that played during the presentation of that information (i.e., ominous, uplifting, or no sound). Participants, then, completed several counterbalanced measures, including rating how much six different words (i.e., three positive and three negative) applied to fish, Willingness to Conserve questions about ocean conservation and fish-repopulation, their knowledge about non-native species, and a series of questions assessing their attitudes toward the marine environment, which consisted of seven different categories (i.e., naturalistic, moralistic, ecologistic, or humanistic, dominionistic, utilitarian, or negativistic). A 3 (Music) x 2 (Video) multivariate analysis of variance revealed a significant effect of video presentation on the combined dependent measure; an effect that was most pronounced on ratings of positive words in relation to fish. The results of the current study demonstrate that video

presentation of information about fish and the marine environment can positively influence perceptions of fish.

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

Chapter Page

LIST OF TABLES

CHAPTER I

INTRODUCTION

Fish are a viable food source that many individuals around the world consume for nourishment. However, many industries have taken advantage of this food source and have caused the phenomenon called overfishing (Overfishing, 2018). The U.S Fish and Wildlife services (2018) believes that if the public were to become more aware of how dangerous overfishing is for the environment, the fish that are becoming endangered could have a better chance of survival. Thus, it is important to examine the public's perceptions of fish and their environment. The current study sought to measure participants' willingness to help ocean conservation and fish-repopulation as well as participants' perceptions of fish, Attitudes about the Marine Environment, and knowledge about non-native species. A 3 (Music: Uplifting, Ominous, No Music) X 2 (Video, Pamphlet) multivariate analysis of variance evaluated the effects of the independent variables on perceptions of fish and participants' willingness to conserve. Participants' knowledge about non-native species and attitudes about non-native species were also evaluated via frequency data.

CHAPTER II

LITERATURE REVIEW

United States Overfishing Practices

Seventy-one percent of our planet's surface consists of water and 96.5% of that water is found in oceans; the creatures, such as fish, living in that water are easy to access (Perlman, & United States Geological Survey, 2016). Fish are a source of nourishment that many individuals around the world harvest for personal sustenance and income. Most of these fish are caught commercially via large fishing vessels and sold in food markets and other businesses. A typical commercial fishing vessel is a large boat that can catch and carry a vast amount of fish for corporations and/or private vendors to sell to the public for consumption. Unfortunately, over the last 50 years, these commercial vessels have pushed about 30% of the world's fisheries beyond their reproducing limits. This is also known as overfishing (Overfishing, 2018).

Overfishing is a "practice of commercial and non-commercial fishing which depletes a fishery (an industry where fish are bred) by catching so many adult fish that not enough remain to breed and replenish the population." (Koster, 2012 pg. 1). Overfishing laws and regulations can be accessed at various State Fish and Wildlife websites. For example, Washington State's Fish and Wildlife regulations address different fish that can and cannot be fished, such as wild steelhead trout. Not only do these regulations limit fishing practices, but they also specify which licenses and types of equipment must be used. These regulations, in turn, affect the amount of fish the public may catch. If the public does not abide by these regulations, it could affect the survival of certain aquatic species.

National Information about Fish and Wildlife

U.S. Fish and Wildlife is a federal government agency that is within the U.S. Department of the Interior. The headquarters for U.S. Fish and Wildlife is located in Washington D.C. with other regional field offices located across the country. According to the National Research Council, under the U.S. constitutional (n.d.) provisions, a state is legally responsible for the protection of its wildlife and administration. Every state in the U.S. has a Fish and Wildlife agency that helps protect and serve not only fish and game, but the public as well. Washington State's Fish and Wildlife mission statement is "To preserve, protect and perpetuate fish, wildlife and ecosystems while providing sustainable Fish and Wildlife recreational and commercial opportunities" (Washington State Department of Fish and Wildlife, 2018).

Because every state in the U.S. has different laws for fishing and hunting, there are issues with some individuals understanding and/or following these laws (National Oceanic and Atmospheric Administration, 2014). If an individual who is from a different state does not review the rules and regulations before they participate in outdoor recreational activities, they could unintentionally violate a law or regulation. Montana State Fish and Wildlife recorded the amount of citations and warnings given in the year 2009. In 2009, 112 citations were given to people while violating the rules of fishing. However, 98,238 warnings were given to people for violating the rules of fishing (Montana Fish, Wildlife, & Parks, n.d.). It would seem that the public is either unaware of the rules and regulations of fishing, or they might not understand the impact overfishing has on the ecosystem.

Daily limits are not the only thing that State Fish and Wildlife personnel regulate within the public and business realm. One of U.S. Fish and Wildlife's many duties is to keep the environment clean so that all life may have access to clean water and a steady supply of fish that helps sustain the human species. According to National Geographic's Causes and Effect of Ocean Pollution (2017), many of the oceans' pollution is caused by polluted streams. These streams become polluted by farmers, human sewage, littering and many other non-eco-friendly practices. However, only having Fish and Wildlife personnel to regulate the laws that have been put into place is currently not enough to keep certain species out of danger. According to U.S. Fish and Wildlife Service (2018), there were 8,792 employees of the U.S Fish and Wildlife Service as of 2017. Having only a few people hired to protect fish and the wildlife is not enough to save certain types of animals from going extinct.

According to the National Oceanic and Atmospheric Administration (NOAA), there are 74 listed species of marine (i.e., found in or produced by the sea) and anadromous (i.e., migrating up river from the sea) fish that are on the endangered, threatened, and/or foreign list (NOAA, 2014) with foreign referring to an endangered fish that is not originally from a certain river or lake. People take these fish and sell them for high prices because they are not typically found in certain areas. Current efforts to help these species include restoring natural habitats, removing certain predators, and breeding species in captivity. The Critically Endangered Animals Conservation Fund (CEACF) is one of the primary organizations that helps to fund projects for critically endangered species. However, a lack of funding has caused delays in various conservation efforts such as the rehabilitation of Atlantic salmon in the Gulf of Main. For example, the

current rehabilitation plan has estimated a total cost of $140,428,000 for 10 years and a total of $351,070,000 for 75 years. This project alone would take a total of 75 years to complete and would have to be monitored constantly (NOAA et al., 2016).

In order to raise money to support current recovery plans for these endangered species, Fish and Wildlife personnel, including consultations with federal and tribal entities are trying to increase public awareness. The U.S Fish and Wildlife services (2018) believe that if the public were to become more aware of how dangerous overfishing was to our environment, these endangered species could have a better chance of survival. With this in mind, it is important to investigate the public's perceptions of animals in general. If an individual does not care about animals and their environment, conserving animals and their environment may not be a priority or a necessity. A person's personal perspective of animals might help guide future efforts to change or increase positive perceptions of the environment and marine life.

Animal Perceptions

There are many perceptions people have toward animals. Positive or negative perceptions may depend on personal experience, observations of the animal(s) in or outside of their natural environment, and the amount of knowledge an individual has of a certain animal such as behavior patterns, lifespan, and anatomy (Kellert & Berry, 1987). In an effort to better identify and investigate the multidimensional perceptions of animals, Kellert and Berry (1987) developed the Attitudes Toward Animals Scale where they identified nine different categories of the manner in which people may view their relationship to animals. The first category is naturalistic, in which individuals show affection for wildlife and the outdoors. The second category is ecologistic in which

individuals show concern about environmental systems and how those systems interact with animals. The third category is humanistic, in which individuals have affection for animals, such as their pets. The fourth category is moralistic, and these individuals show concern for animal rights and show a strong opposition for animal cruelty. The fifth category is scientistic [*sic*] where the individual is mostly interested in the biological functioning of an animal. The sixth category is aesthetic and the individuals in this group show most of their interest in artistic symbolism for animals. The seventh category is utilitarian, in which an individual's primary concern is for the material value of an animal. The eight category is dominionistic in which an individual mostly shows concern over mastery and control of an animal, such as sporting situations. Finally, the ninth category is negativistic with individuals showing mostly fear and avoidance of one or more animals (Kellert & Berry, 1987).

These categories are meant to show an individual's primary concern and individuals are only placed in one type of category even if they show interest in multiple categories since they will not be able to receive the same score in all multiple categories. Each question is tied to one of the nine categories, where participants received a point for answering question positively in the positive categories and answering questions negatively in the negative categories. Individuals are placed into a category based on the answers they give on a 53-question survey using a five-point Likert scale. Kellert and Berry (1987) found that men scored higher in the utilitarian and dominionistic attitude scale while women scored higher in the moralistic and negativistic attitude scale. The authors concluded that women and men could also have different emotional responses to animals, such as women seeing animals as pets and men seeing animals as subsistence.

Kellert and Berry's categories are still used in current research (e.g., Prokop, Ozel & Usak, 2009). Prokop et al. (2009) used these categories to measure students' attitudes, beliefs, and knowledge about snakes across two cultures in Asia and Africa. The authors found that individuals who were more knowledgeable (i.e., scientistic) about certain species were less likely to fear or have a negative viewpoint toward them. However, attitudes toward animals that were associated with danger were not influenced by the knowledge of the animal nor the category they were placed in. Furthermore, when participants were classified as negativistic in a certain category for an animal, the authors hypothesized that the individuals may not have been exposed to that animal or that the exposure was negative.

Prokop and Tunnicliffe (2008) found similar results when examining children's awareness of different types of animals and how likely they were to keep a certain animal as a pet. For example, a bird, crawfish, beetles and rabbits were shown to Slovakian boys and girls between the ages of 10 and 15 and less than 48% of the participants were able to identify the crawfish respiratory system (Prokop & Tunnicliffe, 2008). The authors also found that girls expressed greater preference toward animals that were popular, such as rabbits, resulting in higher negativistic and naturalistic dimensions whereas boys showed a greater interest in uncommon animals and insects, leading to higher ratings in the ecoscientistic [*sic*] dimension. When shown a stage beetle, little was known about the animals in general. When a child knew more about an animal, they were more likely to want to have the animal as a pet.

In Schonfelder and Bogner (2017), German students in the fifth through eighth grades were asked about their perception of bees, their awareness of the insect's potential

extinction, and their willingness as well as reasons for protecting bees. Students who were aware that bees were endangered displayed a willingness to protect bees in order to help humanity and ecology even though they feared the bees. Students also reported that they were afraid of bees, because they had been stung before and the sting hurt them. Pollination and honey were the most common answers that children gave to help bees. These findings indicate that individual's knowledge of an animal alone may affect people's perception of animals. However, if another factor, such as gender and environmental upbringing were included, it might strengthen the correlation between knowledge and perception of animals.

Gender

Men and women appear to differ in their perceptions toward animals. Herzog, Betchart and Pittman (1991) found that female participants showed more concern over animal welfare than male participants. The authors also found that, when asking men about obscure animals, spiders, snakes and toads were more likely to be kept as pets whereas females wanted to keep a horse as a pet. Kellert and Berry (1987) also found that female participants were more likely to enjoy animals that were less aggressive such as birds, cats, and dogs whereas male participants were more likely to enjoy animals that were more aggressive such as tigers, bears, and lions.

There are, however, studies that refute the idea that males and females differ on the Attitudes Toward Animals (ATA) Scale. For example, Azahar, Fakri and Pa (2014) gave veterinary students the ATA Scale developed by Kellert and Berry (1987) and found that male and female participants scored similarly. The authors also found that most participants scored in the negativistic category on the scale. Similarly, Kellert and Berry

(1987) found that when individuals had more education, such as some college or greater, gender differences were less likely to appear in opinions on the ATA scale. These findings suggest that perceptions of animals may be influenced by education and that such perceptions may differ in samples with different education levels.

Environment Perceptions

Although individual's perceptions of animals are important, these perceptions may be influenced by the environment the animal is in. Finlay, James, and Maple (1988) had university undergraduates view photographs of animals in different zoo enclosures and natural settings. Animals were rated less favorably when they were viewed in zoo enclosures with bars and/or with a naturalistic enclosure compared to animals viewed in wild settings and when participants only saw the animal's scientific name on a screen (Finlay et al., 1988). This indicates that the type of setting that an animal is in could influence how individuals perceive those animals as well as the importance of those animals. Fernandez, Tamborski, Pickens and Timberlake (2009) found similar results when examining visitor attraction to zoo exhibits. When the exhibit was more naturalistic, people were more likely to visit the attraction. When an attraction looked enclosed, such as when bars could be seen, and the environment looked manmade, people were less likely to visit that attraction.

A person's current environment or their upbringing may also influence their perceptions of animals. For example, Hampshire, Bell, and Topalidou (2007) conducted a 3-year multi-disciplinary study in Lake Kerkini, Greece, interviewing local people regarding their perceptions of fishing and hunting for subsistence and for profit. Hampshire et al. (2007) found that the individuals who were surviving off the land had

more respect for the animals that were living among them than did those who were able to purchase food from a market or had a reliable food source that did not involve hunting. Mesch and Manor (1998) also found that individuals who had emotional ties to their environment were more willing to be involved in the upkeep of their environment in residential areas. Participants in that study were observed via a homeowner's association, where the outside appearance of the participant's home was judged. Individuals being observed were not informed of a day or time in which they would be judge and were told that they did not have to keep their homes outside appearance clean. The authors found that, if neighbors were friends, they were more likely to keep their housing lot clean. This information could potentially help other experimenters understand why individuals are more willing to help clean up an environment. If individuals have friends or acquaintances who clean the environment, they might be more willing to do the same.

The type of emotion felt by an individual may also influence their attention or perceptions. For example, Zadra and Clore (2011) found that individuals who were feeling sad were more likely to see things as longer or harder. For example, the authors had participants listen to music to induce either a happy or sad emotion. Participants would then look at a picture of a hill and verbally estimate the height of that hill. Individuals who listened to the happy music were more likely to give a smaller number such as five-ten feet tall; whereas participants who listened to sad music were more likely to give a large number such as 45-50 feet tall (Zadra & Clore, 2011). The same groups were also asked to look at the Ebbinghaus Illusion where participants were asked if the circles in the middle of two figures were the same size or different. The correct answer was that the circles were the same size. Participants that had listened to sad music were

more likely to say that the circles were the same size. The happy music group was more likely to say that the circles are different sizes between the two figures. Happiness and sadness in the study were measured using a mood-as-information self-report scale that was proposed as a model by Bless, Bohner, Schwarz, and Strack (1990). That model assumes that positive affective states are correlated with safe and unproblematic environments whereas negative affective states are correlated with problematic situations (Bless, Schwarz, & Kemmelmeier, 1996).

Attention is essential to information processing (Posner, 1978). Relevant stimuli to individuals may vary but adding emotion as a variable could influence an individual's perception of attention. When an individual is given a task to complete and an emotional trigger, such as music, is attached to that task, the way an individual completes that task may change. This could also mean that the amount of attention that is required to complete a task can go down or up depending on the emotional trigger (Tamir & Robinson, 2007). Tamir and Robinson (2007) controlled this by giving participants a mood survey where they assessed participants' daily moods by asking how often they felt certain positive emotions such as "calm, cheerful, confident, enthusiastic, excited, happy, proud, and relaxed" or negative emotions such as "afraid, angry, anxious, ashamed, downhearted, guilty, irritable, nervous, and sad" during the day (Tamir & Robinson, 2007, pg. 1127). The authors found that positive moods affected selective attention in that participants would prioritize potentially rewarding stimuli rather than neutral or negative stimuli. In other words, individuals who were either induced to feel happy or reported their happiness were more likely to select tasks that were rewarding.

Video Presentations and Participant Perceptions

It is thought that videos are better at changing a person's perception than a static image which is defined as a visual picture of a frame that does not move (Jiang & Benbasat, 2007). For example, Jiang and Benbasat (2007) showed participants four different products via an online format. The online products were shown using four different conditions, including static pictures, video without narration, video with narration, or a visual product experience with participants viewing products in only one of the four conditions. Jiang and Benbasat (2007) found that both video conditions were significantly higher in website diagnosticity (i.e., the extent the consumer believes the website is helpful) compared to static images. Authors also found that the better diagonosticity a website had, the more positive review of a product the participant had, which should result in a website for a product being visited more often. Other studies have investigated visual presentations as a way of changing individual's perceptions.

Jiang and Benbasat's (2007) findings that video was superior to static images can be explained by Paivio's (1991) dual coding theory which is used to examine verbal and visual retention as a mental process involving connections of reinforcement between two systems. "According to the dual coding theory, verbal and visual channels in the brain assimilate information. The assimilation of the information occurs differently in each channel; however, these streams of information are interconnected" (Harder & Bruening, 2008 pg. 47). In order to support the Paivio (1991) dual coding theory, Harder and Bruening (2008) aimed to determine if video presentation affected knowledge and barriers regarding study abroad opportunities.

Harder and Bruening (2008) recruited college students from Pennsylvanian State University and separated students into two groups. The treatment group received a pretest survey, watched three videos over the course of three weeks and then took a posttest. A control group was treated the same as the treatment group but received lectures from professors rather than videos. Harder and Bruening (2008) found that students that participated in the treatment group became more aware of international issues through online videos compared to those in the control group who receive only verbally-delivered information about international programs. However, both groups showed an increase in their learning of international issues. Therefore, having both online videos and in person lectures could potentially help contribute to changing an individual's perception but online videos appear to be superior in improving awareness.

However, too much visual input may be detrimental. Ghinea and Thomas (1998) found that participants were more likely to have a correct understanding of the portrayed message in a commercial when the commercial was less dynamic. In their study, dynamic was defined as multiple things happening, such as the rate in which each frame was shown, the amount of information being shown or said, and the type of music and visual presentation that was shown. Non-dynamic was when visual and auditory presentations did not overpower the message that was trying to be relayed. Ghinea and Thomas found that when commercials were more dynamic, the amount of entertainment the participant claimed to feel was rated as higher than non/less dynamic commercials. However, the overall message of the commercial such as the brand of toothpaste, the type of food being sold, or the different brand name clothing was less likely to be remembered by the participant when the commercial was too dynamic. For example, when music was so

overpowering that you could not hear what the individual in the commercial was clearly saying about the weather, participants found the video annoying rather than informational (Ghinea & Thomas, 1998).

Music Presentations and Participant Perceptions

Many studies over the years have concluded that music is a language for emotion (Brown, 2000; Huron, 2006). Emotion, as described by Blaustein and Kinniburgh (2010), is an internal process that is thought to be maintained so that a person may be at a state of arousal. The six basic emotions as described by Ekman, Levenson and Friesen (1983) are happiness, anger, disgust, surprise, sadness, and fear. When specific music is played for an individual, there could be an emotional response (Juslin & Laukka, 2004). These authors proposed a new measure to examine expression, perception, and induction of emotion and music that could potentially help others use appropriate music to change an individual's perception. Some of the main characteristics of emotional music have correlation with faster or slower tempos. For example, a piece of music with a slower tempo is often rated as being more depressed or sad, whereas a faster tempo piece of music is perceived as happy or upbeat (Hunter, Schellenberg, & Schimmack, 2008; Webster & Weir, 2005).

Sammler, Grigutsch, Thomas, and Koelsch (2007) investigated if consonant (i.e., pleasant) music and dissonance (i.e., unpleasant) music could influence emotion, using similar musical pieces that were electronically manipulated. Specifically, each dissonant piece had two shift changes of the original consonant piece so that there was a tri-tone below and one tone above. Tri-tone is defined as three steps or tones below the original key. Tri-tone can be used as a negative or dissonant response, because the tone can be

unpleasant to the ear due to its lower key. Lower keys have been found to provoke a sad or negative emotion in participants (Gagnon & Peretz, 2003). Sammler et al. (2007) found that consonant excerpts induced pleasant emotions while unpleasant emotions were associated with dissonant counterparts. Ultimately, it has been found that musical excerpts could potentially bring out certain emotions in an individual such as happiness and sadness.

Not only can music potentially effect emotion, but it can also potentially influence how individuals perceive or attend to visual stimuli. Grosjean (1980) designed the grating paradigm, where words that varied in length (i.e. the number of syllables) and frequency (i.e. tone and pitch) were presented to participants in either long or short context. For example, the word 'Gul' was used in both long a short context. In the short context, it would be pronounced as 'Gul'. In long context, it would be pronounced as 'Guuuuuul'. Participants would then guess what word was being said by writing it down. Grosjean (1980) found that lower frequency words took longer for participants to identify than higher frequency words. In addition, shorter words with one syllable were easier to identify. If higher frequency words and shorter syllable words are easier to identify, it might be similar to music and how it is processed in individuals. In Vieillard, et al. (2008), the grating paradigm was used to evaluate the shortest amount of time it would take for a participant to reliably recognize an emotion within a song. Music from popular movies, such as Jaws were played for participants, along with 56 other musical pieces. Vieillard et al. (2008) results indicated that 91% of emotions (i.e., happy, peaceful, scary, and sad) were successfully identified within the song.

Bhattacharya and Lindsen (2016) had participants observe the color grey while listening to different types of music, (i.e., happy, peaceful, scary, and sad). These musical pieces were chosen from a Vieillard et al. (2008) study where the musical pieces were validated via the grating paradigm. Participants were shown a color grey while they were listening to one of the four pieces of music. After listening to the music, participants were shown five different colors of grey and were asked to indicate which color was the same as the one that they saw earlier. Bhattacharya and Lindsen (2016) found that participants reported a brighter shade of grey from the original when positive music was played. Positive music was considered to be happy and peaceful music. When participants listened to negative music, which was scary or sad music, participants reported viewing a darker shade of grey even though all participants were shown the same color grey throughout the experiment. If music is able to alter participant's visual perceptions, then it might be possible that when both video and audio stimuli are put into place, participant's perceptions could be altered.

Video and Audio Presentations and Participants Perceptions

Previous research has found that music and videos can elicit emotion or alter participants' self-reported perceptions on a topic (Cohen, 2001; Dibben, 2001; Moore, 2013; Nosal, Keenan, Hastings and Gneezy, 2016). Cohen (2001) indicated that there are essential criteria that must be fulfilled for a film to influence the audience, building upon Tan's (1995) outlined laws of emotion. The first law, according to Tan, is control precedence. This law states that background music that takes control over the audience could emote a true emotion. Cohen (2001) compared music to each of Tan's (1996) laws of emotion and found that music could control an emotional response (Hunter,

Schellenberg, & Schimmack, 2010; Webster & Weir, 2005). As noted previously, Webster and Weir (2005) found that different tempos of music could induce different types of emotions. The second law proposed by Tan is the "Law of concern: emotion entails identifiable concern" (Cohen, 2001 pg. 263). This law states that music should be able to connect with an object. For example, advertisement and a music jingle played at the same time gives the object a recognizable meaning. The third law states that each emotion has a situation in which it is elicited. A stimulus will then have mandatory characteristics that are needed to elicit a specific emotion. For example, a certain smell could elicit an emotion based off of the individual's memory. The fourth law is that a stimulus must contribute to the sense of reality of the participant. The fifth law states that the stimulus has to be able to change. In the environment, cues are given that will lead the participants to believe or realize that something is happening. If the stimulus does not follow these changes the emotion will no longer be present. The final emotion law mentions complete realization and how the audience should not have control over their emotional response. With all the criteria for Tan's (1995) laws of emotion met, it might be safe to presume that music might elicit emotion. Although the current study will not be using these laws to examine musical pieces, these laws should be taken into account by professional musical analysis to rate different musical excerpts.

Vela (2005) examined emotional stimuli that can influence participants' emotions, using commercials that contained discursive processing and visual field changes. Participants were exposed to auditory or visual scenes that were either informative or emotional, resulting in increased emotional responses for stimuli in commercials that had a lower audio component along with a slower tempo, also known as adagio. This means,

that when showing participants video with an emotion-seeking audio, there needs to be less audio that is played as allegro (i.e. loud and fast) type music. This could potentially be important, because if the audio is being played too fast, the message of the video might not be interpreted appropriately and correctly.

In concurrence with Vela's (2005) study, Nosal et al. (2016) found that music during shark documentaries could influence people's perception of sharks and their willingness to fund non-profit shark foundations. In particular, participants regarded sharks as more negative when ominous music was played whereas when uplifting music was played, participants regarded sharks as more positive than negative and were more likely to support and donate to shark conservation when compared to those who had not heard music. These findings suggest that when uplifting music and video presentation are paired, individuals might have a more positive view toward animals, along with a higher willingness to help conservation programs.

With the research that has been done on videos and music, especially Nosal et al. (2016), the current study is designed to examine how videos and music effect participants' perception of wildlife. Given that Nosal et al. (2016) found that music could change perceptions of sharks, it might mean that other types of marine life videos could influence participant's perceptions to be more positive toward marine life when certain types of music are played. If this is the case, it could mean that conservations for fish and their environment could receive more support in the future, along with helping preserve planet earth.

Hypotheses of the Current Research

The purpose of the current study was to investigate the effects of music and video presentations on participants' perceptions of aquatic conservation activities as well as the perception of fish and the marine environment. In particular, this study was designed to determine if certain types of music in conjunction with video presentations of information about the marine environment would impact environmental perceptions of aquatic conservation activities. The hypotheses for the current study were that perceptions of aquatic conservation activities and the perceived ability of the individual to impact fish conservation would be influenced by both music (i.e., ominous, uplifting or no sound) and video presentation of information about the marine environment (i.e., video with fish and subtitles or pamphlet). Perceptions about fish, conservation, and the marine environment were measured by two different scales, the Willingness to Conserve Scale and a Fish and Environment Perception Questionnaire. A Non-Native species scale and Attitudes About the Marine Environment (AAME) in America were also used in the current study but were not used to measure perceptions of fish. These scales add to the current study by examining participant's level of knowledge about non-native species, and observing participants attitudes about the marine environment through seven different categories.

CHAPTER III

METHOD

Participants

Participants in this study were students enrolled in psychology classes at Central Washington University in Ellensburg, Washington. Recruitment occurred through an online platform for research studies in the psychology department. Participants were 18 years of age or older. Participants for this study had the opportunity to be reimbursed with extra credit, if applicable, for one selected class. The study description was available for participants to read through the online platform (i.e., Sona System), and it indicated that they would potentially experience music, videos, or written descriptions. Demographic information on age, gender, ethnicity, current academic year, if they actively fish, if they consume fish and, if not, why they do not consume fish, were collected. The majority of participants were 22 years of age (M = 22.7, SD = 0.5). For demographic information, please see Table 1.

Table 1

Frequency (%) and Number of Participants for Demographic Categories

Demographic Categories	Frequency (N)	Percentage
Gender		
Male	42	27.3
Female	109	70.8
I Prefer not to Answer	1	0.6
Race		
Caucasian	96	62.3
Asian	6	3.9
Hispanic or Latino	28	18.2
African American or Black	10	6.5
American Indian or Alaska Native	2	1.3

Table 1 Con.

Frequency (%) and Number of Participants for Demographic Categories

Demographic Categories	Frequency (N)	Percentage
Native Hawaiians or other Pacific Islanders	2	1.3
Other	8	5.2
Year in School		
Freshman	37	24.0
Sophomore	24	15.6
Junior	39	25.3
Senior	51	33.1
Graduate Student	1	0.6
Actively Fish		
Yes	24	15.6
No	128	83.1
Consume Fish		
Yes	119	77.3
No	33	21.4
Why Not? (n = 32)		
Taste / Smell	27	17.5
Vegetarian / Vegan	2	1.3
Health Reasons	2	1.3
Other	1	0.6

Due to video and auditory presentations in the study, participants were excluded if they were unable to understand English or were visually impaired (i.e., unable to see out of both eyes) and/or hearing (i.e., unable to hear out of both ears) impaired.

Materials and Apparatus

Video. A brief clip from British Broadcasting Corporation's (BBC) *Planet Ocean* (Allwood Arthus-Bertrand, & Pitiot, 2012), which included fish and an aquatic ecosystem, was shown to participants. The clip was two minutes and 48 seconds in length. The clip presented a diversity of fish species in a marine setting. Subtitles on the

video presented information about aquatic species and facts about overfishing. Participants were unable to stop the video or alter the video playback. All participants completed two sound checks prior to the stimulus presentation. The first sound check was a woman saying the word "Cat" three times. The second sound check was a man saying the word "Dog" three times. For both of these checks, participants had to enter the word that was heard. In two of the video groups, music played along with the video (i.e., ominous and uplifting). The third group had no sound to accompany the video.

In the control subtitles-only condition, participants viewed a PowerPoint presentation, with a bluish-grey background and black text that was identical to the subtitles visible in the video condition. Participants were not able to control the PowerPoint, with slides progressing forward to match the pace of narration in the video condition. This served as a pamphlet-like condition for participants to gain knowledge about aquatic life. An example of the information appearing on slides was "About 97 percent of all of the Earth's water is found in the oceans, with the rest in freshwaters, lakes, rivers, and icecaps" (Blue Planet Aquarium, 2018, pg.1). The slides were timed to present the same information in two minutes and forty-eight seconds as the video.

Music. There were three levels of music (i.e., ominous, uplifting and no music/sound) that were selected based upon previous research. These musical selections were chosen in order to elicit either positive or negative emotions in the participants.

Negative (Ominous) Music. Different types of music have been found to elicit different types of emotions (Brown, 2000; Huron 2006; Juslin & Laukka, 2004; Hunter et al., 2008; Webster & Weir, 2005; Sammler et al., 2007). Disjointed (i.e., when the melody is disconnected or has many leaps in tones) and unpredicted (i.e., when the

melody changes from its original tone to confuse the listener) musical pieces are thought to elicit negative emotions in participants (Moore, 2013). The ominous music for this experiment was taken from BBC's (2001) *The Blue Planet* soundtrack by George Fenton (2001). Previous research conducted by Nosal et al. (2016) had a musical specialist examine all sound tracks by Fenton (2001) and identified track eight of the composition entitled "Shark", a three minute and 43-second-long piece, to be ominous. It was also stated that track eight has "modal with only fragments of melody accompanied by sporadic and sparse atmospheric percussion and a repetitive flute motif that creates unsettling sound…" (Nosal et al., 2016, pg. 2). However, since the piece of music has repetitions throughout the latter half of the song, only two minutes and 45-seconds of the song was used and matched the length of the uplifting musical piece, with only a two second difference.

Positive (Uplifting) Music. Music that is more fluid and conjoined is thought to bring a more positive emotion to a participant (Webster & Weir, 2005; Sammler et al., 2007). The uplifting music for this experiment was taken from BBC's (2001) *The Blue Planet* soundtrack by George Fenton (2001). This song entitled "The Blue Planet" was also examined by the same musical specialist in Nosal et al. (2016) as previously mention. This song (Track 1) of the album was identified as uplifting and was a two minute and 48-second-long piece. This song was only two seconds longer than the "Shark" musical piece used in the ominous conditions.

Surveys

Fish and Environment Perception Questionnaire. The design of the questionnaire was similar to Nosal et al. (2016) with slight modifications for the current

experiment as noted below. The questionnaire consisted of a total of six words that were randomly presented to participants. Each word was shown to participants individually and participants rated the relevance of each word as it pertained to fish and their environment. The original scale included negative words (i.e., scary, dangerous and vicious) and positive words (i.e., peaceful, beautiful, graceful). These words were altered from Nosal et al. (2016) for the current study. Three words with negative connotations (i.e., depressing, boring and ugly) and three words with positive connotations (i.e., peaceful, beautiful and graceful) were presented in the current study. Instructions for participants were presented at the top of the screen and read 'Please rate how much 'word' describes fish'. Participants rated each word on a seven-point Likert scale ranging from 1 (*not at all*) to 7 (*very much*). All words were placed into categories by the principle investigator. For the current study, negative word ratings were reverse-coded and each participant's average ratings for the negative words and positive words were collected with higher scores indicating more positive ratings of fish and their environment. Cronbach's alpha for the three positive words and three negative words were .78 and .57, respectively.

An open-response item asked participant for a word that they felt described fish. Participants' free responses were placed into one of four categories (i.e., negative, positive, neutral, unknown) by using similar criteria from Nosal et al. (2016).

Willingness to Conserve Measure. Two items, composed for the current study, examined participant's willingness to support ocean conservation, 'To what extent are you willing to support ocean cleanup?' and 'To what extent are you willing to support re-population of fish and their habitat?' on a seven-point Likert scale ranging from 1 (*very*

unwilling) to 7 (*very willing*). Higher scores were interpreted as greater willingness to support ocean conservation.

Attitudes to Non-Native Species in the US. A 19-question scale from Gonzlan, Burnard, Andreou, and Britton (2013) was adapted for use in the current study to investigate if participants were aware of what a non-native species was and if their perception of the level of threat posed by non-native species and certain environmental conflicts was influenced by the video and music presentations. Only six of Gonzlan et al.'s (2013) original 19 questions were used in the current study. Two questions related to the importance of protecting the environment and other important issues such as health care and education. These questions were rated on a five-point Likert scale ranging from 1 (*most important*) to 5 (*not important*). Lower scores on these questions indicated more positive reactions to the environment. Participants were then asked about their knowledge of non-native species through a five-point Likert scale ranging from 1 (*extensive*) to 5 (*none*). Lower scores on this question indicated more knowledge about non-native species. If participants indicated that they had no knowledge of non-native species, they were not presented with the questionnaire. If participants chose any other answer, they were asked another three questions. Two of these questions had multiple answers, such as where the participant has heard of non-native species, and the reason for controlling non-native species. The final question asked about participants' perceptions of threat level non-native species had on the environment. This question used a five-point Likert scale ranging from 1 (*extensive*) to 5 (*none)*. Higher scores on this question indicated more negative reactions to non-native species. There was no previous research on this scale

that included psychometric analysis. Cronbach's alpha for the Non-Native Species scale in the current study was $\alpha = .69$.

Attitudes About the Marine Environment in America (AAME). The questionnaire was adapted for the current study from Kellert, Gibbs, and Wohlgenant's (1995) Attitudes About the Marine Environment in Canada Scale. The scale was revised by the experimenter for the current study in order to focus on fish rather than seals and whales as well as on the American Pacific Northwest rather than the Canadian North Atlantic. For example, "I believe people have the right to exert mastery and control over the marine mammals of the North Atlantic", was modified to 'I believe people have the right to exert mastery and control over fish of the Pacific' (Kellert et al., 1995, pg. 71). Participants answered questions on a five-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Questions ranged from humanistic to negativistic with lower scores indicating negative attitudes of fish. Ratings allowed participants to be scored on seven different categories. There were four ecological questions, five humanistic questions, 13 moralistic questions, four naturalistic questions, four negativistic questions, nine utilitarian questions, and eight dominionistic questions. These categories were the same used by Kellert and Berry (1987). Participants received one score for each category (i.e., naturalistic, moralistic, ecologistic, or humanistic, dominionistic, utilitarian, or negativistic). In the current study, Cronbach's alpha for scores across the seven categories was .78, and varied for each separate category (i.e., dominionistic, $\alpha = .60$; moralistic, $\alpha = .68$; naturalistic, $\alpha = .26$; negativistic, $\alpha = .45$; humanistic, $\alpha = .36$; ecologistic, $\alpha = .52$; and utilitarian, $\alpha = .75$).

Procedures

All data collection was conducted online. After agreeing to participate in the study, participants answered demographic questions before receiving the stimuli. Prior to presenting the stimuli, all participants were asked to turn up the volume on their device. Two audio checks occurred in which participants verified that they heard a female voice saying the word 'Cat' three times and a male voice saying the word 'Dog' by typing the word that they heard. Once the audio checks were completed, participants were randomly assigned to one of six conditions combining the independent variables of the video presentation and music presentations: 1) Video-ominous; 2) video-uplifting; 3) video-no music/sound; 4) pamphlet-ominous; 5) pamphlet-uplifting; and 6) pamphlet-no music/sound. After exposure to the materials, participants completed the Fish and Environment Perception Questionnaire, the Willingness-to-Conserve questionnaire, the Attitudes to Non-Native Species in the U.S., and the AAME, with scales presented in counterbalanced order. Informed consent was obtained prior to data collection and all procedures were approved by the Institutional Human Subjects Review Council.

Design

This study included two independent variables consisting of video presentation (i.e., video or pamphlet) and music type (i.e., ominous, uplifting, or no music) with participants completing the Fish and Environment Perception Questionnaire, a Willingness-to-Conserve questionnaire, an Attitudes to Non-Native Species in the U.S., and the AAME.

Statistical Analysis

Fish and Environment Perception Questionnaire. Ratings for positive and negative words were averaged separately to provide two distinct scores. Ratings for negative words were reversed-coded so that higher scores indicted more positive perceptions.

Willingness to Conserve Analysis. Each participant generated a rating for their willingness to support ocean conservation and another for their willingness to support fish re-population. Higher scores indicated positive scores toward supporting ocean conservation and fish re-population.

AAME Analysis. Participants received seven different scores, one for each of the corresponding seven categories (i.e., naturalistic, moralistic, ecologistic, humanistic, dominionistic, utilitarian, or negativistic). Participants' highest overall score was used to place them into one of the AAME's seven categories. Participants could only be placed in one category group.

Non-Native Species Analysis. Out of 152 participants, only 15 participants indicated that they knew the definition of a non-native species and, therefore, completed this scale. Higher scores indicated that participants had greater perceived threat of non-native species on certain environmental factors, such as competition, habitat destruction, and predation.

MANOVA. As noted previously, a MANOVA is a Multivariate Analysis of Variance. A 3 x 2 MANOVA was conducted to determine the effect of music and video presentation on the combined dependent measure of the Fish and Environment Perception Questionnaire and Willingness to Conserve.

CHAPTER III

RESULTS

A total of 193 participants started the survey but 28 did not complete at least 49% of the items or did not finish watching either the video or pamphlet, while seven participants were removed for failing both sound checks. Mahalanobis distance was used to identify multivariate outliers and resulted in six further participants being removed, resulting in a total of 152 participants.

Negative word perception scores were reverse-scored to ensure that higher scores indicated positive perceptions of fish and their environment. Descriptive data for the Fish and Environment Perception Questionnaire, and the Willingness to Conserve measures are presented in Table 2.

Table 2

Descriptive Statistics for Video and Pamphlet Conditions for the Fish and Environment Perception Questionnaire and Willingness to Conserve (n = 152)

	Video			Pamphlet		
Survey	*Mode*	*M*	*SD*	*Mode*	*M*	*SD*
Fish and Environment Perception Questionnaire						
Negative Perceptions (Reversed-coded)						
Ugly	3.0	4.9	1.6	3.0	4.6	1.6
Depressing	6.0	5.3	1.5	7.0	5.2	1.6
Boring	6.0	5.2	1.5	3.0	4.5	1.6
Positive Perceptions						
Peaceful	6.0	5.5	1.2	6.0	5.1	1.4
Beautiful	7.0	5.9	1.0	5.0	5.4	1.2
Graceful	6.0	5.6	1.2	6.0	5.1	1.4
Willingness to Conserve						
Ocean Cleanup	7.0	6.1	1.0	7.0	6.2	1.0
Fish Repopulation	6.0	5.7	1.0	6.0	5.8	1.0

A 3 (Music: Uplifting, Ominous, No Music) X 2 (Video, Pamphlet) MANOVA assessed the effects of the independent variables on the combined dependent variables which included ratings from the Fish and Environment Perception measure (positive word perceptions and negative word perceptions), and Willingness to Conserve questions. A non-significant Box's M test (p =.42) indicated homogeneity of covariance matrices. The MANOVA revealed that the video altered the combined dependent variable, Wilks' $\lambda = .928$, $F(4,142) = 2.77$, $p < .02$, partial $\eta^2 = .07$. For each dependent variable, univariate analyses of variance (ANOVA) was conducted as a follow-up to the MANOVA revealing that the video ($M = 5.69$, $SD = .94$) significantly improved fish and environment perceptions as measured by the ratings of positive words, $F(1,145) = 7.42$, $p < .01$, $\eta^2 = .04$, compared to the pamphlet ($M = 5.25$, $SD = 1.16$) condition. There were no main effects or interactions involving the music variable. No main effects or interactions were observed in univariate ANOVAs for the other dependent variables.

AAME Subcategory Results

Data for each subcategory of the AAME scale were examined. Frequency data showed that 72.1% ($n = 111$) of participants scored the highest in the moralistic category and the lowest in the negativistic category (3.2%, $n = 5$). The high scores for the moralistic category indicated that the majority of individuals showed concern for marine animal rights and showed a strong opposition to marine animal cruelty. The low scores in the negativistic category indicated that few individuals showed fear and avoidance of fish. Further frequency data for the scale categories can be found in Table 3.

Table 3

Frequency Data for Categories in the AAME (n = 152)

Categories	Frequency	Percentage
Dominionistic	9	5.8
Moralistic	111	72.1
Naturalistic	7	4.5
Negativistic	5	3.2
Ecologistic	6	3.9
Humanistic	8	5.2
Utilitarian	6	3.9

Free Response for Fish and Environment Questionnaire Results

Participants' free responses for words that participants felt described fish were separated into negative responses, positive responses, neutral responses, and unknown responses. A total of (n = 152) responses were examined and categorized; neutral responses were the most common category of word responses for participants (n = 71). Data for all categories can be found in Table 4.

Table 4

Participants' Frequency (%) and Number of Free Response to a Word that Represented Fish (n = 152)

Response	Frequency	Percentage
Negative Response	14	9.2
Positive Response	54	35.5
Neutral Response	71	46.7
Unknown	13	8.6

Non-Native Species Questionnaire Results

Out of all participants (n = 152), a total of 15 indicated that they knew what a non-native species was, therefore, completed the Non-Native Species scale. Participants were asked six questions about the perceived level of threat that non-native species have on seven different environmental factors with higher scores indicating higher perceived threat. Descriptive statistics with the full item inventory of the scale can be found in Table 5. Descriptive statistics for the primary reason why participants thought non-native species should be controlled, can be found in Table 6.

Table 5

Descriptive Statistics for the Full Item Inventory for the Attitudes to Non-Native Species in the US (n = 15).

Please indicate your perception of the level of threat posed by these issues associated with non-native species:	*M*	*SD*	Response Range
Competition	3.4	0.6	3-5
Habitat Destruction	3.6	0.5	4-5
Disease Transmission	3.3	0.8	3-5
Predation	3.1	0.8	3-5
Hybridization (inter-breeding with native species)	3.0	0.8	2-5

Table 6

Descriptive Statistics for the Final Question, Attitudes to Non-Native Species in the US – Primary Reasons for Controlling Non-Native Species (n = 15)

Which of the following should be the primary reason for controlling non-native species	Frequency	Percentage

Table 6 Con.

Descriptive Statistics for the Final Question, Attitudes to Non-Native Species in the US – Primary Reasons for Controlling Non-Native Species (n = 15)

Which of the following should be the primary reason for controlling non-native species	Frequency	Percentage
Economic cost of damage	4	26.7
Loss of ecological function	6	40.0
Recreational use of the environment	2	13.3
Intrusive value of wildlife	3	20.0

CHAPTER IV

DISCUSSION

The current study examined the effects of music and video perception on perceptions of fish and their environment and on the willingness of participants to engage in marine conservation activities. In the current study, video presentation yielded ratings for fish compared to the pamphlet condition with regard to ratings of positive words in relation to fish. It was also found that 46.7% of participants expressed a neutral response for the free response word perception that they felt represented fish. Results for the AAME scale in the current study found that 72.1% of participants scored the highest in the moralistic category of the scale. AAME results for the lowest frequency category was the negativistic category, with 3.2% of participants falling into this category.

Results for the Non-Native Species scale indicated that participants had moderate perceived threats of non-native species against all environmental issues presented (i.e., competition, habitat destruction, disease transmission, predation, and hybridization). It was also observed that 40% of those participants who knew what a non-native species was found that 'loss of ecological function' should be the primary reason for controlling non-native species. The lowest frequency for reasons for controlling non-native species was 'recreational use of the environment, with only 13.3% (n = 15) of participants indicating this as the primary reason.

Perception and Willingness to Conserve

The perception measures used in the current study were designed to test participants' perceptions of fish using different words. In previous research, Nosal et al. (2016) found that participants had more positive perceptions about sharks after they had

viewed an uplifting video but more negative perceptions after listening to ominous music along with a video presentation. The current findings did not reveal any effects of music on perception measures but did find that watching a video presentation about fish and aquatic life improved fish perception compared to reading that same information in a pamphlet-style condition. Interestingly, this effect was observed for positive word ratings rather than for negative word ratings, suggesting that video presentations may be differentially impactful at improving positive perceptions of aquatic life.

Participants in the current study were also asked to provide a free response word that they felt represented fish after receiving the six perception words. Nosal et al. (2016) also asked participants to provide one additional word that they felt described sharks. Results for Nosal et al. (2016) study indicated that participants in the ominous video group provided more negative words that those in the uplifting video group. The current study found that a majority of participants (i.e., 46.7%; n = 152) provided a neutral response for a word that they felt described fish, regardless of the stimulus group in which they were randomly placed. The current study's findings differed from Nosal et al. (2016), which might suggest that asking participants to think generally about all fish, rather than a specific order of fish might be too broad of a question, resulting in participants producing neutral responses regardless of stimulus.

Nosal et al. (2016) also recorded participants' self-reported willingness to conserve and similar measures were included in the current study. Nosal et al. (2016) found that participants were more willing to donate to conservation programs after watching a video accompanied by uplifting music. The current study did not observe an effect of either music or video presentations on participants' willingness to engage in

marine conservation activities. The current findings may have differed from Nosal et al. (2016) due to differences in how the questions were asked. In Nosal et al. (2016), participants were asked one question about the extent in which they supported the restoration of shark populations. However, in the current study, participants were asked two questions; one question pertaining to ocean conservation support and the second regarding restoration of fish populations, suggesting that asking about fish in general or asking two specific questions about conservation may have altered conservation intent.

As well, the current sample differed from Nosal et al. (2016) in demographics. Nosal et al. (2016) had a total of 616 participants with a mean age of 30, with 39.6% of participants being female. The current study had 70.8% (n = 152) of participants identifying as female. According to Herzog et al. (1991) and Kellert and Berry (1987), females show more concern for animal welfare than male participants and the current sample had very high scores on both conservation measures, suggesting that ceiling effects may have limited the ability of our manipulations to further increase conservation intent.

Music Effect

As previously mentioned, the current study found that the video stimulus significantly improved positive word perception ratings of fish but that music did not have a similar impact. This is surprising given that many studies have found that music promotes emotion (Brown, 2000; Huron, 2006; Juslin & Laukka, 2004). However, multiple elements need to be examined for music to elicit a certain emotion. Sammler et al. (2007) found that pitch effects individuals' emotions, while Hunter et al. (2008) and Webster and Weir (2005) found that musical tempo affected participants' emotions.

Vieillard et al. (2008) and Grosjean (1980) also found that more drawn out notes have greater negative effects on participants' emotions. The use of musical excerpts entitled "Shark" and "The Blue Planet" were used for the current study. Although both musical excerpts were professionally scored and evaluated for emotional stimulation by Nosal et al. (2016), the musical excerpts may not have been evaluated with all the criteria mentioned above. Thus, the music used in the current study may not have produced as strong an emotional response, limiting the music's ability to alter perceptions of fish and aquatic environment.

Attitudes Toward Marine Species Effect

Kellert et al. (1995) examined participants' attitudes toward marine life to determine the prevalence of different mindsets, particularly differences between positive (i.e., naturalistic, moralistic, ecologistic, or humanistic) and negative (i.e., dominionistic, utilitarian, or negativistic) mindsets. Kellert et al. (1995) found that males tended to have higher scores in the negative category when asked questions about marine life, and women had higher scores in the positive category when asked questions about marine life. The current research found that most participants scored the highest in the moralistic category. The moralistic category had questions designed to determine if participants showed concern for animal rights and a strong opposition for animal cruelty. The current study, however, does differ with regard to some of Kellert et al.'s (1995) findings. For example, in the current study, only one of the five participants who scored the highest in the negativistic category was male, only two of the six participants who scored the highest in the utilitarian category were male, and only three of the nine participants who scored the highest in the dominionistic category were male. The remaining participants

who scored the highest in these groups were female. While this may have been due, in part, to the predominantly female sample in the current study, these findings do suggest that items within the scale need to be updated to relate to the current generation of participants.

Importantly, Kellert et al. (1995) claimed that dominionistic, utilitarian, and negativistic mindsets all represented negative perceptions of the marine environment. Of the more than 150 participants in the current study, only 20 scored highest within these three categories, indicating that the majority of participants had positive perceptions about the marine environment. It should also be noted that out of the 42 male participants who completed the current study, 36 of them had higher scores in the positive perception categories, revealing that a majority of males in the current sample had positive perceptions about the marine environment. The fact that the sample had generally positive feelings toward the marine environment also may have complicated our ability to observe effects of the video or music on perceptions of fish, given that these participants may have already been highly supportive of the marine environment prior to our manipulation. These positive perceptions, as revealed by the AAME included, more positive affection for wildlife and the outdoors (naturalistic), concern for the environment and how environmental systems interact with animals (ecologistic), affection for animals, such as pets (humanistic), and finally, concern for animal rights (moralistic).

Non-Native Species Effect

As previously discussed, Gozlan et al. (2013) explored the public's and conservation managers' perspectives about non-native species and found differences between the public and conservation managers' perceptions of non-native species and the

threat they pose to the environment. Unfortunately, few participants in the current sample were aware of what a non-native species was and, therefore, did not complete the questionnaire. However, of those who did, participants' responses for the level of threat non-native species have on completion, habitat destruction, disease transmission, predation, and hybridization, ranged from 5 (*extensive*) to 3 (*some*). Out of the 15 participants' who completed the scale, not a single participant indicated that non-native species had no threat to the categories listed above. When asked to select a primary reason for controlling non-native species, a majority of participants indicated that non-native species posed a threat to the loss of ecological function and, thus, must be controlled. These results indicate that the general public needs more education about what non-native species are and that, once educated, individuals do see such species as potential environmental threats and find value in controlling them.

Limitations of the Current Study

The current study did have some limitations, including modifications to the scales and the development of an original scale to measure our participants' Willingness to Conserve. And, while previous studies (Kellert et al., 1995; Nosal et al., 2016) did use items from the AAME and the Fish and Environment Perception Questionnaire, those surveys were altered to relate them to the focus of the current study which was fish and aquatic environments. In doing so, the surveys reliability and validity may have been altered. Low Cronbach's alphas for three out of seven categories for the AAME (i.e., naturalistic, negativistic, humanistic) indicated that several items in those categories may not have measured similar constructs. Future research may benefit from using the original questionnaire or comparing the original and altered versions of the questionnaires.

Additionally, as noted, the current study utilized a Willingness to Conserve scale that had not been previously validated. Future research may benefit from using a previously validated measure to explore the relationships between willingness to conserve, music, and video presentations about the aquatic environment.

Additional limitations may be that the current study was conducted completely online. In online platform studies, participants are not monitored to ensure they are completing each portion of the study appropriately. Participants who took the current study may not have been free of external complications. Participants were able to take the current study with other sounds playing in the background, the ability to move away from the computer while the video/pamphlet was playing, and the option to mute their sound after completing the sound checks. If participants were to complete the current study in a lab, they could not mute the computer, are less likely to walk away from the computer unless they wished to end the study, and would not have the potential for unwanted sounds playing during the stimulus presentation. Future research may benefit from conducting this research in a controlled lab setting and comparing findings between in-person and online data collection procedures. Future research may also benefit from conducting a pre-posttest of participants perceptions of fish and their willingness to conserve. This could potentially help researchers see if the stimuli had any effect on participants' perception.

In conclusion, the current study examined participants' perceptions of fish and their environment and found that video presentations of fish and aquatic environments improved perceptions of those fish compared to presenting the same information in a pamphlet-style condition. These findings are important because they show that

individuals respond more to video stimuli compared to pamphlet or music presentations. It, then, might be beneficial to show videos to the public about fish and their environment, rather than have them read these facts without any visual stimuli. The findings also indicate that the public needs to be educated about non-native species, along with other environmental threats but that, in general, the sample showed positive perceptions of animals and high conservation intent. Our planet requires that human engage in behavioral changes for the environment to survive and such changes can start by improving individuals' perceptions and knowledge about the environment.

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APPENDIXES

APPENDIX A

Demographics

1. Please identify your gender

   - Male
   - Female
   - Other
   - I prefer not to answer

2. What is your age?

3. What race do you identify as?

   - African American or Black
   - Asian
   - American Indian or Alaska Native
   - Hispanic or Latino
   - Native Hawaiian or other Pacific Islanders
   - Caucasian
   - Other

4. What year in school are you?

   - Freshman (0-49.9 credits)
   - Sophomore (45-89.9 credits)
   - Junior (90-134.9 credits)
   - Senior (135-180+ credits)
   - Graduate Student

5. Do you actively fish?

   - Yes
   - No

6. How many times during the year do you fish?

   - 1-5
   - 6-10
   - 10-15
   - 16+

7. What state have you lived in the longest?

   - Not from the US
   - All other 50 states listed

8. Name the country you have lived in the longest.

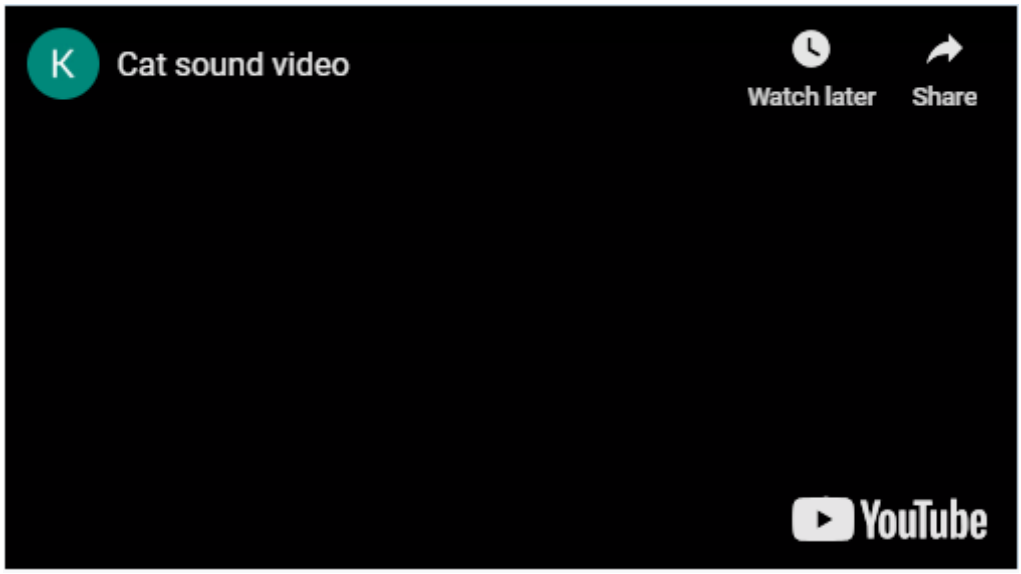
APPENDIX B

Sound Test

Sound Test One Instructions

You will be listening to an audio file for the next section. Please make sure your volume is on for the **ENTIRE** survey.

The video will play automatically, please do **not** click on the screen

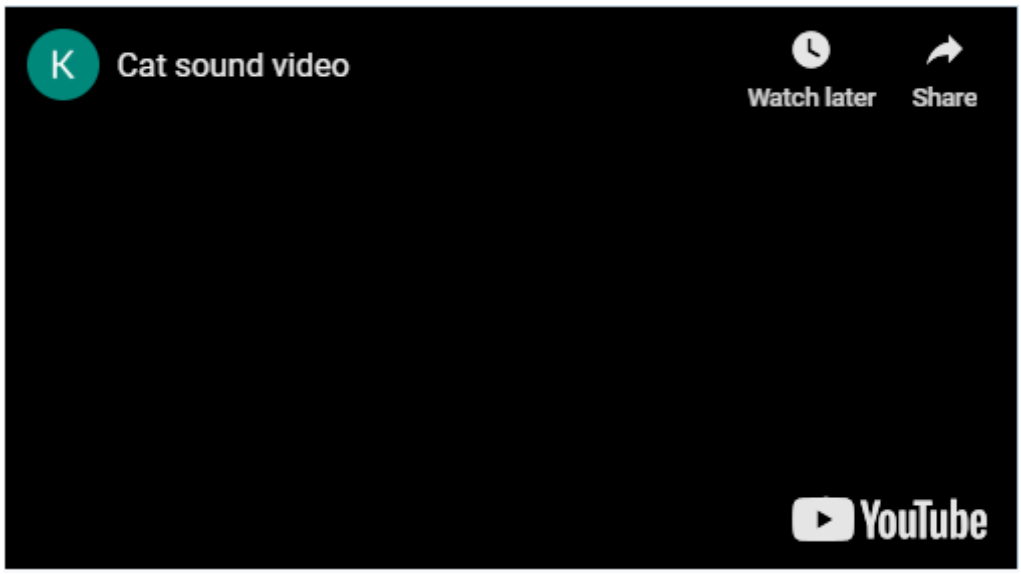


What word was being said in the audio file?

Sound Test Two Instructions

You will be listening to an audio file for the next section. Please make sure your volume is on for the **ENTIRE** survey.

The video will play automatically, please do **not** click on the screen



What word was being said in the audio file?

APPENDIX C

Presentation Stimuli – Subtitles

Video Presentation

Please listen and watch the **entire** video. This question requires your sound to be on.

Script of Subtitles – Spaces indicated separate slides

Sadly due to a changing climate and the harmful effects of human behavior, many sea creatures across the world are becoming endangered

The oceans are home to many astonishing creatures, from the gigantic blue whale to a miniscule fish

72 percent of the Earth's surface is covered in water. Water is an essential part of life for every living thing.

About 97 percent of all of the Earth's water is found in the oceans, with the rest in freshwater, lakes, and icecaps

There is no exact figure of how many marine species are currently living in the world's oceans.

Marine experts have estimated anything between 1 million and 10 million sea creatures

As new species are discovered all the time, many species border on the point of extinction

The international Union for Conservation of Nature (IUCN) currently list more than 360 species as endangered already or vulnerable of becoming so

These figures are rising every day, with ocean trash coming a major concern for the welfare of sea creatures big and small

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APPENDIX D

Word Perception – Positive and Negative

Perception Measure

How correct is the word **"<u>insert word</u>"** in describing fish?

	Very Incorrect	Incorrect	Slightly Incorrect	Unsure	Slightly Correct	Correct	Very Correct
Ugly	-	-	-	-	-	-	-
Depressing	-	-	-	-	-	-	-
Boring	-	-	-	-	-	-	-
Peaceful	-	-	-	-	-	-	-
Beautiful	-	-	-	-	-	-	-
Graceful	-	-	-	-	-	-	-

Each word will be shown randomly and separately.

Perception Check

Please type a word that you feel represents fish.

APPENDIX E

Willingness to Conserve – Positive or Negative

Support Measure

1. To what extent are you willing to support ocean cleanup?

Very Unwilling	Unwilling	Somewhat Unwilling	Unsure	Somewhat Willing	Willing	Very Willing

2. To what extent are you willing to support re-population of fish and their habitat?

Very Unwilling	Unwilling	Somewhat Unwilling	Unsure	Somewhat Willing	Willing	Very Willing

3. In what ways would you support fish conservation and/or repopulation?

APPENDIX F

Attitudes Toward Non-Native Species

Environmental Awareness

How do you think the US government should prioritize spending in the following areas?

	Extremely Important	Important	Somewhat Important	Somewhat Unimportant	Unimportant	Extremely Unimportant
Healthcare	-	-	-	-	-	-
Education	-	-	-	-	-	-
Economic Development	-	-	-	-	-	-
Defense	-	-	-	-	-	-
The Environment	-	-	-	-	-	-

Please indicate your perception of the threat that the following environmental issues pose:

	Extensive	Much	Some	Little	None
Climate Change	-	-	-	-	-
Chemical Pollution	-	-	-	-	-
Habitat Destruction	-	-	-	-	-
Non-Native	-	-	-	-	-

Species					
Human Overpopulation	-	-	-	-	-

Do you have any prior knowledge on the subject of non-native species?

Extensive	Much	Some	Little	None

Perceptions of Non-Native Species

Please indicate where you have heard about non-native species:

Television	Magazine
Newspaper	Word of Mouth
Internet	I haven't heard of such issue
Scientific Journal	Other:
Radio	

Please indicate your perception of the level of threat posed by these issues associated with non-native species:

	Extensive	Much	Some	Little	None
Competition	-	-	-	-	-

Habitat Destruction	-	-	-	-	-
Disease Transmission	-	-	-	-	-
Predation	-	-	-	-	-
Hybridization (interbreeding with native species)	-	-	-	-	-

Which of the following should be the primary reason for controlling non-native species?

Recreational use of the environment	Intrusive value of wildlife
Economic cost of damage	Other:
Loss of ecological function	I haven't heard of such issue

APPENDIX G

Attitudes About Marine Animals Scale

Marine Scale

Below is a list of marine mammals and other animals. How do you feel about each of the following animals?

	Dislike a great deal	Dislike somewhat	Neither like nor dislike	Like somewhat	Like a great deal
Whale	-	-	-	-	-
Wolf	-	-	-	-	-
Cod	-	-	-	-	-
Shark	-	-	-	-	-
Polar Bear	-	-	-	-	-
Seal	-	-	-	-	-
Deer	-	-	-	-	-
Walrus	-	-	-	-	-
Trout	-	-	-	-	-
Bald Eagle	-	-	-	-	-
Porpoise	-	-	-	-	-

Black Bear	-	-	-	-	-
Sea Lion	-	-	-	-	-

Below are a number of statements, people might make about marine mammals in general, and whales and seals in particular Please indicate how much you agree or disagree with each of the following statements There are no right or wrong answers, we just want your opinion.

	Strongly Agree	Moderately Agree	Moderately Disagree	Strongly Agree	No Opinion
I think most fish are strange looking	-	-	-	-	-
People occasionally have to hunt animals like fish, or they will lose their fear of man and increasingly become a problem	-	-	-	-	-
I think it would be great, if practical, to have a small shark or salmon as a pet	-	-	-	-	-
I believe people have the right to exert mastery					

and control over fish in the Pacific	-	-	-	-	-
I have great affection for fish like salmon and sharks	-	-	-	-	-
I am not really interested in fish	-	-	-	-	-
I think it would be scary to see a fish in the wild	-	-	-	-	-
I would describe myself as a person who loves fish	-	-	-	-	-
I have little desire to travel long distances just to see a fish	-	-	-	-	-
fish symbolize to me the beauty and wonder of nature	-	-	-	-	-
I have little interest in leaning about the ecology or population dynamics of fish	-	-	-	-	-

I like to see pictures of fish, but I am not interested in seeing one in the wild	-	-	-	-	-
I would be afraid if I was in a small boat and saw a shark in the open ocean	-	-	-	-	-
One has to admire the skill and daring of shark hunters who hunt sharks in wooden boats in the dead of winter	-	-	-	-	-
I would be far more likely to visit the Pacific Ocean if I knew I could see shark or ray there	-	-	-	-	-
I cannot imagine how some people can say they love animals like fish	-	-	-	-	-

To help us understand your opinions about marine mammals, we would like to learn how much you know about them. Do not be concerned if you do not know the answers to some of these questions, some people do, and some don't.

Do you think any of the following animals are generally in danger of becoming extinct in the foreseeable future (i.e., an endangered species)?

	Yes	No	I Don't Know
Humpback Whale	-	-	-
Caribou	-	-	-
Grey Seal	-	-	-
Grizzly Bear	-	-	-
Hooded Seal	-	-	-
Red-Tailed Hawk	-	-	-
Blue Whale	-	-	-
Moose	-	-	-
Northern right Whale	-	-	-
Beaver	-	-	-
Harp Seal	-	-	-
Seagull	-	-	-
Beluga Whale	-	-	-

This section contains statements about marine mammals, the various methods used to harvest these animals, and the various methods that could be used to protect these animals. In order to make well-informed decisions about marine mammals, commercial

fishing, and other economic activities, it is very important to consider the opinions and concerns of the public.

Please indicate how strongly you agree or disagree with the following statements

	Strongly Agree	Moderately Agree	Moderately Disagree	Strongly Agree	No Opinion
I believe the clubbing of fish as a means of killing them inflicts great suffering on the animals	-	-	-	-	-
I generally get bored by scientific discussions fish like sharks and salmon	-	-	-	-	-
In my opinion, any restriction on commercial fishing in the Pacific to help rare fish could threaten the future of commercial fishing in the Pacific	-	-	-	-	-
I am generally opposed to the					

hunting of any fish regardless of the purpose	-	-	-	-	-

People have different opinions about harvesting marine mammals. Please indicate how strongly you agree or disagree with the following statements

	Strongly Agree	Moderately Agree	Moderately Disagree	Strongly Agree	No Opinion
I think people can do without killing abnormally large fish to take pictures with them, even if the elimination of this Industry economically hurts some people					
I believe the issue of conserving fish is being used as a way to stop development In the Pacific					
I am opposed to the hunting of juvenile fish under any circumstance					
I enjoy seeing fish in an aquarium, but I am not very interested in					

learning about the ecology and biology of these animals	
If a fish species is abundant, I believe the economic and cultural needs of peoples who have traditionally hunted these animals justify the continued hunting of fish	
I support the protection of endangered fish in the Pacific even if oil development has to be curtailed	
I see nothing wrong with the hunting of fish for sport if the species is abundant and the hunt is carefully regulated	
I am opposed to the harvest of abundant fish populations if the results in the US being harshly criticized by other countries	
I may never see a fish in the Pacific, but it is important for me to know they exist there	

The US trade with China is too important to limit, because some Chinese fishing boats harm fish	
I would be proud to live in a country that had restored rare fish to their previous abundance	
I am opposed to restoring fish to their previous abundance in the Pacific if it results in less commercial fishing	
I believe in the proposal to reduce fish numbers because they supposedly compete with fishing which is just an excuse for resuming the commercial hunting of fish	
The development of the US's offshore oil and gas resources are too important to limit just because of its possible harm to fish	
I am opposed to the hunting of any kind	

of fish under any circumstance	
A Pacific shark hunt should be allowed if there are no other employment opportunities for fishermen during the season when the hunt occurs	

How strongly do you agree or disagree with each of the following statements about commercial fishing and fish?

	Strongly Agree	Moderately Agree	Moderately Disagree	Strongly Agree	No Opinion
I doubt that fish do any damage to commercial fishing	-	-	-	-	-
Fishermen who deliberately harm sharks caught in their nets should be severely punished	-	-	-	-	-
Because fish can develop diseases when they school or shoal together and can cost the fishing industry millions, we should help reduce the spread of the disease by hunting large amounts of fish	-	-	-	-	-
I am opposed to capturing fish for					

display in aquariums or zoos unless it clearly does no harm to the species and results in measurable educational benefits	-	-	-	-	-
Shark populations should not be allowed to increase in areas where commercial fishermen are having difficulty locating fish	-	-	-	-	-
The protection of an endangered species like a shark must be considered a higher priority than the needs of commercial fishermen	-	-	-	-	-
I think using shark fins is not worse than using leather from cows	-	-	-	-	-
The government should not reduce fish populations to decrease the possible spread of disease because this is a part of the risk of fishing	-	-	-	-	-
Unintentional killing of sharks in fishermen's nets is regrettable, but the economic benefit of	-	-	-	-	-

using large nets justified this impact					
I support passing a law to protect areas of the ocean important to fish, even if it results in less commercial activities in this area	-	-	-	-	-
I believe the interest of commercial fishermen must be considered before those of fish	-	-	-	-	-
Commercial fishing should not be allowed in areas where sharks are found during the season when they are having their young	-	-	-	-	-
While I do not agree with killing fish for luxury products. I believe that abundant fish species could be killed to provide food for humans	-	-	-	-	-
A fisherman is justified in killing predator fish that damage fishing equipment or steal fish from their nets	-	-	-	-	-

The quota for the amount of fish that can be commercially caught is called a Total Allowable Catch. Do you think that the possible impacts on other marine life from commercial fishing should be considered when setting the Total Allowable Catch?

- Yes
- No
- I don't know

How many times have you done each of the following activities in the past 5 years?

	Never	1-2 times	3 or more times	I don't know
Gone Whale watching	-	-	-	-
Visited an Aquarium	-	-	-	-
Read books about marine life	-	-	-	-
Seen any films about marine life	-	-	-	-

Have you gone sport fishing in the past 2 years?

- No
- Yes
- I don't know

On how many days did you engage in commercial fishing during the past two years?

- Less than 10 days
- 10-30 days
- 1-3 months
- 3-6 months
- More than 6 months

What were the **three types** of fish you caught most often while commercial fishing during the past two years? (If less than three, write N/A)

- Type One: [Fill in the blank]
- Type Two: [Fill in the blank]
- Type Three: [Fill in the blank]